# Changes in the vertebrate fauna of Menorca in prehistoric and classical times

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## Abstract

Studied the small vertebrate remains from an archeological locality in Menorca to determine the influence of human activities on the composition of the fauna. It is concluded that at least two major introductory phases occurred: *Mus musculus, Apodemus sylvaticus, Eliomys quercinus* and *Oryctolagus cuniculus* during the Neolithic; *Rattus rattus, Crocidura suaveolens* and *Mustela nivalis* during the Roman Age. Some remarks on the introduction and extinction of other vertebrates are made.

## Introduction

Man is thought to have arrived in the Balearic Islands (Mallorca and Menorca) around 5,000 BC (Waldren 1982). At that time, Menorca was inhabited by an endemic terrestrial vertebrate fauna, consisting of one species of bovid *(Myotragus balearicus)*, a shrew *(Nesiotites hidalgo)*, one or two dormice (*Eliomys [Hypnomys] morpheus* and *E. [H.] mahonensis*), a lizard (*Lacerta [Podarcis]* sp.) and a frog *(Baleaphryne talaioticus)*.

After man's arrival this original endemic fauna became extinct due to factors such as hunting, attempted domestication, predation by introduced carnivores, competition and habitat destruction. The extinction process took several millennia. During this period other species appeared in Menorca. The recent vertebrate fauna of the island now includes a variety of species (Alcover 1979), although it should be mentioned that the fauna is still poor in species compared to continental south-western Europe. It is generally accepted that the entire recent vertebrate fauna (both wild and domesticated) has been introduced by man (Alcover 1980). The exact sequence of introductions (of the recent species) and extinctions (of the original endemics) is extremely difficult to assess.

Up till recently only a few, mainly unpublished, data have been available concerning the sequence of introductions and extinctions. Mr J. A. Alcover (Palma) mentioned two faunas; one (Rafal Rubí) dating back to the 14th–13th century BC, contained the introduced species *Eliomys quercinus, Apodemus sylvaticus, Mus musculus* and *Oryctolagus cuniculus,* in addition to the original endemic lizard and frog. Apparently the endemic mammals were already extinct by that time. The other fauna (Binicalaf) is said to date back to the 3rd century BC and was found to contain the same four mammal species.

Abundant new data have become available through the excavation of the Taula Torralba d'en Salort by teams working under the direction of Dr W. H. Waldren (Deià, Oxford) and Dr M. Fernandez Miranda (Madrid).

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*Table 1*

**Minimum number of individuals in samples 1–5, 8–18 and 22**
(– = absent)

| Level | V | IV inf. | | IV sup. | | | | III | | II inf. | | | | | | II sup. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample no. | 1 | 3 | 4 | 2 | 5 | 17 | 18 | 15 | 16 | 8 | 9 | 10 | 11 | 12 | 14 | 13 | 22 |
| *Eliomys quercinus* | 82 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | – | 3 | – | 1 | 4 | 1 | 1 | 7 | – |
| *Apodemus sylvaticus* | 58 | 18 | 4 | 34 | 2 | 1 | 1 | 1 | 2 | 22 | 4 | 11 | 24 | 30 | 6 | 166 | 2 |
| *Mus musculus* | 34 | 26 | 7 | 82 | 8 | 5 | 2 | 1 | 4 | 69 | 4 | 28 | 93 | 109 | 18 | 514 | 2 |
| *Rattus rattus* | – | 1 | 1 | 2 | – | – | – | – | – | 3 | – | 1 | 2 | – | – | 1 | – |
| *Crocidura suaveolens* | – | 1 | – | – | – | 4 | 1 | – | – | 40 | 1 | 6 | 13 | 88 | 13 | 229 | 2 |
| *Oryctolagus cuniculus* | – | 2 | – | 1 | – | – | – | – | – | 1 | – | – | – | – | – | 1 | – |
| *Mustela nivalis* | – | – | – | – | 1 | – | – | – | – | – | – | – | – | – | – | – | – |
| *Canis familiaris*[1] | – | – | – | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| *Felis libyca*[2] | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| *Lacerta (Podarcis)* sp. | – | 4 | 3 | 9 | 2 | 4 | 2 | 1 | 3 | 5 | 1 | 15 | 32 | 119 | 2 | 12 | 1 |
| *Hemidactylus* sp. | – | – | – | – | – | 1 | – | – | – | – | – | 1 | 4 | – | – | 1 | – |
| unident. reptile | – | – | – | – | – | – | – | – | – | – | – | – | 1 | – | – | – | – |
| *Baleaphryne talaioticus* | – | 6 | 1 | 9 | 1 | – | – | – | – | 1 | – | 1 | 2 | 1 | – | 12 | – |
| Aves | 2 | 3 | 1 | 3 | – | 2 | 1 | – | – | 8 | 1 | 5 | 19 | 15 | 2 | 9 | 1 |
| Total | 176 | 62 | 19 | 143 | 16 | 18[3] | 8 | 4 | 9 | 152 | 11 | 69 | 194 | 363 | 41 | 951 | 8 |

[1] *Canis* is also known from other sectors in level IV. – [2] *Felis* is known by two mandibles in level III. – [3] excluding some fish remains.

## The locality

The Taula is a large megalithic structure, standing in the centre of the remains of a horseshoe-shaped building, which has been excavated.

Five strata can be distinguished in the sediments. A combination of $C^{14}$ dates and evidence from archaeological finds (such as coins) leads to the following stratigraphy (Sanders and Reumer, in press):

| | |
|---|---|
| level I: | 4th century AD–present |
| level II sup.: | 2nd–3rd century AD |
| level II inf.: | 2nd century AD |
| level III: | 0–1st century AD |
| level IV sup.: | 1st century BC |
| level IV inf.: | 3rd–2nd century BC |
| level V: | 9th–8th century BC |

A total of 23 samples of fossilized owl's regurgitation pellets was recovered from the sediments. Some of these originate from an area where the sediments had been disturbed at some stage in the Taula's history; since the exact stratigraphical position of these samples is uncertain, they are not included in the present study.

*Table 2*

**Percentages of small mammals through the levels**
based on the data given in table 1

| combined samples | V | IV inf. | IV sup. | III | II inf. | II sup. |
|---|---|---|---|---|---|---|
| *Eliomys quercinus* | 47.1 | 4.9 | 4.1 | 11.1 | 1.5 | 0.8 |
| *Apodemus sylvaticus* | 33.3 | 36.1 | 25.7 | 33.3 | 16.3 | 18.2 |
| *Mus musculus* | 19.5 | 54.1 | 65.5 | 55.6 | 54.0 | 55.9 |
| *Rattus rattus* | – | 3.3 | 1.4 | – | 1.0 | 0.1 |
| *Crocidura suaveolens* | – | 1.6 | 3.4 | – | 27.1 | 25.0 |
| n | 174 | 61 | 148 | 9 | 594 | 923 |

## Results and discussion

Table 1 gives the faunal content of samples 1–5, 8–18 and 22, expressed as the minimum number of individuals. Table 2 gives the percentages of the small mammals found in the different levels of the locality. The Figure summarizes the presence or absence of the various taxa in the levels of the Taula's sediments, as well as in the above-mentioned faunules from Rafal Rubí and Binicalaf.

The only mammals found in the single sample from level V are *Eliomys quercinus*, *Apodemus sylvaticus* and *Mus musculus*. This is what we expected, as the faunules from Rafal Rubí and Binicalaf also contain these species. Apparently, these species, and the rabbit, were brought to the island by the early (Neolithic) settlers.

None of the early faunas contains *Rattus rattus* and *Crocidura suaveolens*. These two species, and also *Mustela nivalis* and the gecko *Hemidactylus* sp., appear for the first time around the 2nd century BC (level IV). It was in the 2nd century BC, namely in 123–122 BC, that the Romans, led by Quintus Caecilius Metellus, conquered the Balearic Islands (Pericot Garcia 1972). Thousands of colonists were brought in and it seems plausible that ships began to ply frequently. It is therefore tempting to assume that it was the Romans who caused a second immigration-wave of vertebrates.

Until recently it was not known that *R. rattus* was present in Menorca as early as the 2nd century BC. Its presence in our samples is rather unexpected, as this species was generally believed to have colonized the Balearic Islands during the Middle Ages (Alcover

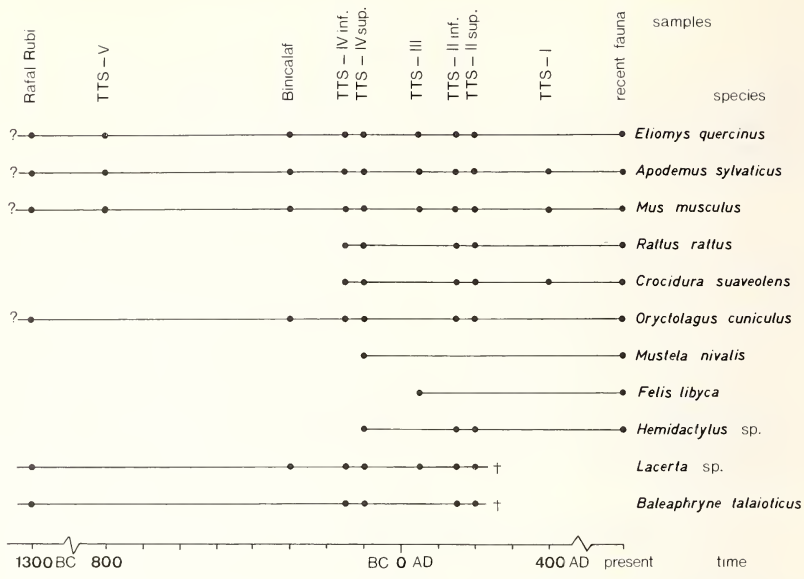


*Fig. 1.* Chart showing the presence of vertebrate species in several Menorcan archaeological localities and in the recent fauna. The localities (top) are correlated to the time-scale (bottom). Dots indicate the presence of a species in the corresponding locality or level. TTS-V = Taula Torralba d'en Salort, level V; etc.

1980). The rat never became a very frequent fauna element, but the species is present in all levels (except in the small samples from level III).

*Crocidura suaveolens* seems much more successful than *R. rattus*. Its frequency is low in level IV (not exceeding 3.4 %), but then increases sharply, reaching over 27 %. The position of the oldest *Crocidura* remains (sample no. 3) in the sediments suggests that this shrew was introduced between 150 and 100 BC, which coincides with the dates of the Roman occupation.

Marked changes in frequency are seen in *Mus musculus* (an increase) and *Eliomys quercinus* (a decrease) in the interval between levels V and IV. We should like to explain these changes as a response to the introduction of carnivores (notably *Mustela* and *Felis;* Reumer 1980; Sanders and Reumer in press). For *Apodemus sylvaticus* large shifts in percentages are not observed, although a slight overall decreasing trend is noted.

The rabbit *Oryctolagus cuniculus* was already present in Menorca in the 14th–13th century BC. Since rabbits were not domesticated before the Middle Ages, these specimens must have been wild animals imported from the Spanish mainland (Bökönyi 1974).

The oldest remains of *Mustela nivalis,* viz. an incomplete left mandible, were found in level IV sup. and have been dated 1st century BC. Another specimen, a juvenile cranium, was found inside the wall of an adjacent building (a talayot), together with remains of domestic animals, an iron sickle and ceramics that are typical for the period 400 BC–100 AD (Punic). This find does not contradict an introduction in or just before the 1st century BC.

The oldest Menorcan *Felis* remains (two mandibular rami of the same individual) originate from level III: 1st century AD. Although the Romans can be held responsible for the spread of the domestic cat, we cannot be certain whether it was actually the Romans who brought *Felis* to the islands, as the cat is known in Mallorca from levels dating back to 1100–700 BC (Bökönyi 1974; Alcover 1979; Pericot Garcia 1972).

The dog *(Canis)* is found in level IV in several parts of the Taula. Dogs were

domesticated long before the Balearic Islands were occupied by Neolithic man (Bökönyi 1974); it is therefore quite possible that the dog was kept in Menorca even before the Roman invasion.

As far as non-mammalian vertebrates are concerned, the lizard *Lacerta (Podarcis)* sp. is found in nearly all levels, but most frequently in levels III and II inf. It is now extinct in Menorca itself, but still survives *(L. [P.] lilfordi)* on several small islands off the coasts of Mallorca and Menorca. The gecko *Hemidactylus* sp. is found in Menorca from the 1st century BC onwards. At present *Lacerta sicula* also lives in Menorca; it was most probably imported from Italy after the 3rd century AD.

Apart from *Lacerta* sp., the only other species of the original Menorcan endemic fauna that survived into historic times is the frog, *Baleaphryne talaioticus*. It is now extinct, but a related species *(B. muletensis)* still survives in remote mountainous areas in Mallorca. (For these taxa, see Alcover et al. 1981).

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**Zusammenfassung**

*Veränderungen der Wirbeltierfauna auf der Insel Menorca in prähistorischer und klassischer Zeit*

Untersucht werden die Überreste von kleinen Wirbeltieren aus einem archäologischen Fundort auf der Insel Menorca, um die menschlichen Einflüsse auf die Zusammensetzung der Fauna festzustellen. Es gab mindestens zwei wichtige Introduktionsphasen: *Mus musculus, Apodemus sylvaticus, Eliomys quercinus* und *Oryctolagus cuniculus* während des Neolithikums; *Rattus rattus, Crocidura suaveolens* und *Mustela nivalis* während der Römerzeit. Einige Bemerkungen über Introduktion und Aussterben anderer Wirbeltierarten werden gemacht.

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